SATPREP Name_____

Assignment- Scatter plot

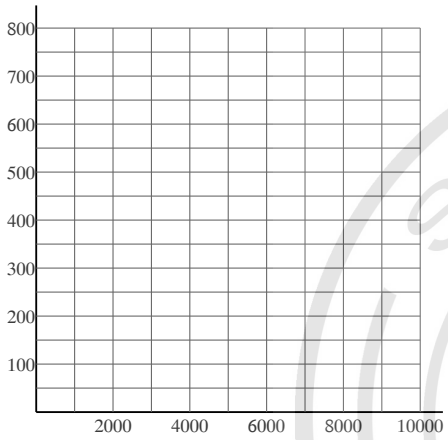
Date_____

Construct a scatter plot. State if there appears to be a positive correlation, negative correlation, or no correlation. When there is a correlation, identify the relationship as linear, quadratic, or exponential. Also find the slope-intercept form of the equation of the line that best fits the data and its r^2 value.

1)

X	Y
1,000	200
2,000	400
3,000	500
5,000	700
5,000	700

X	Y
6,000	700
7,000	800
7,000	800
9,000	800
10,000	800

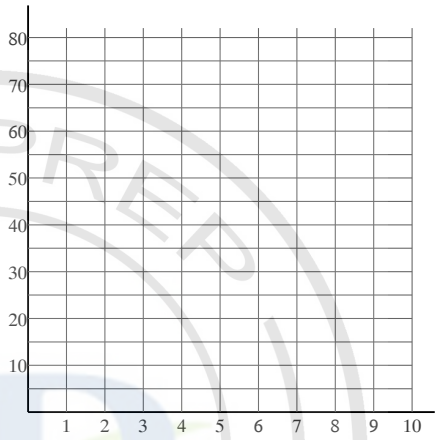


2)

X	Y
1	82
2	57
6	18
7	12

X	Y
7	14
8	13
10	15

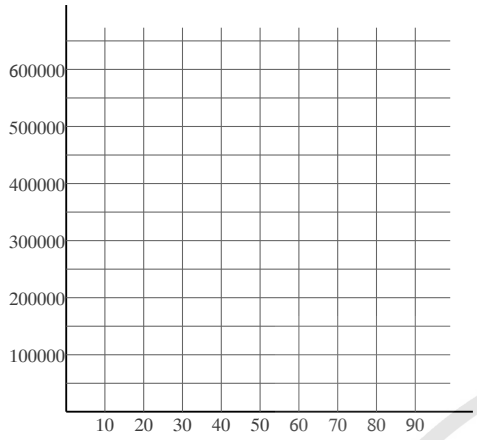
X	Y
10	16
10	16
10	17



3)

X	Y
7	5
8	8
26	56
31	116
36	217

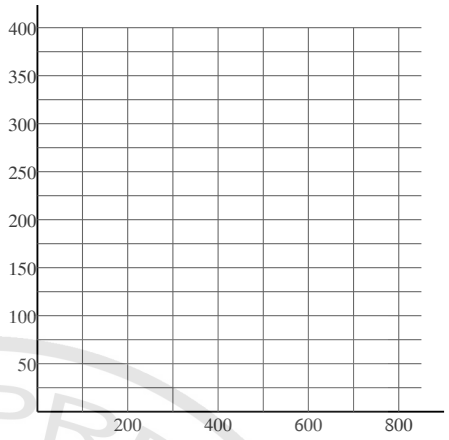
X	Y
64	7,780
84	104,374
85	121,558
92	272,203
99	673,073



4)

X	Y
90	400
280	300
420	300
440	300
590	200

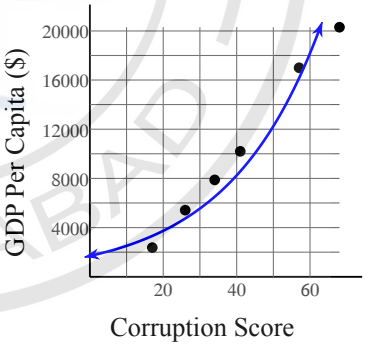
X	Y
630	200
660	200
800	100
810	100
850	100



5) Economists have found that the amount of corruption in a country is correlated to the productivity of that country. Productivity is measured by gross domestic product (GDP) per capita. Corruption is measured on a scale from 0 to 100 with 0 being highly corrupt and 100 being least corrupt:

Corruption Score	GDP Per Capita ($)
17	2,370
26	5,420
34	7,880
41	10,200
57	17,000
68	20,300

This can be modeled by the equation $y = 1700 \cdot 1.04^x$ where x is the corruption score and y is GDP per capita in dollars.



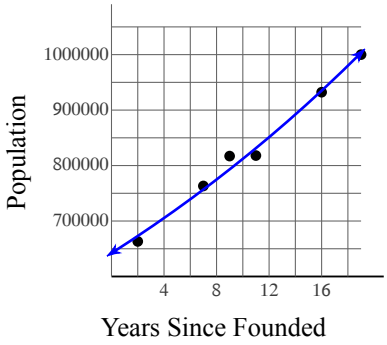
a) What does the y-intercept of this function represent?

b) According to the model, what would be the GDP per capita of a country with a corruption score of 51? Round your answer to the nearest dollar.

6) The population of a city is given for several years:

Year	Population
2	663,000
7	763,000
9	817,000
11	818,000
16	932,000
19	1,000,000

This can be modeled by the equation $y = 642000 \cdot 1.02^x$ where x is the number of years since the city was founded and y is the population.



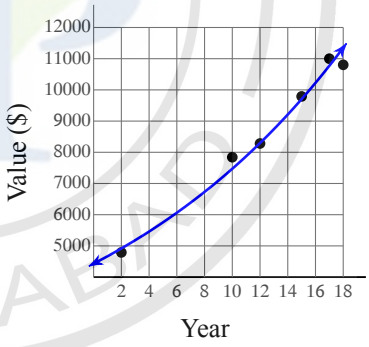
a) What does the y-intercept of this function represent?

b) According to the model, what was the city's population 3 years after it was founded? Round your answer to the nearest hundred.

7) Here is the value of Totsakan's investment over time:

Year	Value ($)
2	4,790
10	7,840
12	8,280
15	9,790
17	11,000
18	10,800

This can be modeled by the equation $y = 4430 \cdot 1.05^x$ where x is the number of years and y is the value in dollars.



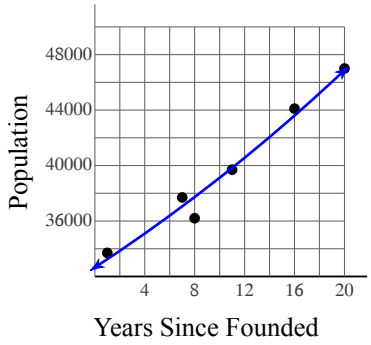
a) What does the y-intercept of this function represent?

b) According to the model, what was the value of the investment after 6 years? Round your answer to the nearest dollar.

8) The population of a city is given for several years:

Year	Population
1	33,700
7	37,700
8	36,200
11	39,700
16	44,100
20	47,000

This can be modeled by the equation $y = 32600 \cdot 1.02^x$ where x is the number of years since the city was founded and y is the population.



a) What does the y-intercept of this function represent?

b) According to the model, what was the city's population 14 years after it was founded? Round your answer to the nearest hundred.

9) The number of times that a school has won the national college basketball tournament is related to the number of times that the school has participated in the tournament. This can be expressed as $y = 0.00329x^2 - 0.0539x + 0.0951$ where x is the number of appearances in the tournament and y is the number of championships they have won.

a) Using this model, a school with 58 appearances in the tournament would be expected to have won how many championships? Round your answer to the nearest whole number.

b) Based on this model, how many tournament appearances would you expect from a school that won 2 championships? Round your answer to the nearest whole number.

10) Economists have found that the amount of corruption in a country's government is correlated to the gross domestic product (GDP) per capita of that country. This can be modeled by $y = 1540 \cdot 1.04^x$ where x is the corruption score and y is GDP per capita in dollars. Corruption scores range from 0 to 100 with 0 being highly corrupt and 100 being least corrupt.

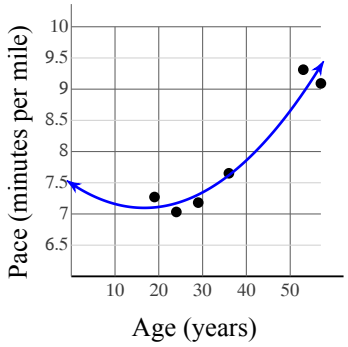
a) Using this model, a country with a corruption score of 78 would have what GDP per capita? Round your answer to the nearest dollar.

b) A GDP per capita of $8,000 corresponds to what corruption score, according to the model? Round your answer to the nearest whole number.

11) The running pace for the fastest female runner for their age in the Race for Hope 5k is given for several ages:

Age	Pace (minutes per mile)
19	7.27
24	7.03
29	7.18
36	7.65
53	9.31
57	9.09

This can be modeled by the equation $y = 0.0014x^2 - 0.0467x + 7.49$ where x is age and y is average pace in minutes per mile.



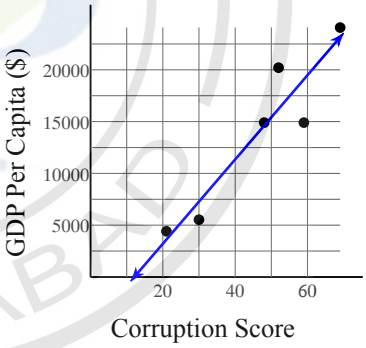
a) What does the y-intercept of this function represent?

b) Using this model, what would be the pace for the fastest 47-year-old woman? Round your answer to the nearest hundredth.

12) Economists have found that the amount of corruption in a country is correlated to the productivity of that country. Productivity is measured by gross domestic product (GDP) per capita. Corruption is measured on a scale from 0 to 100 with 0 being highly corrupt and 100 being least corrupt:

Corruption Score	GDP Per Capita ($)
21	4,410
30	5,530
48	14,900
52	20,200
59	14,900
69	24,100

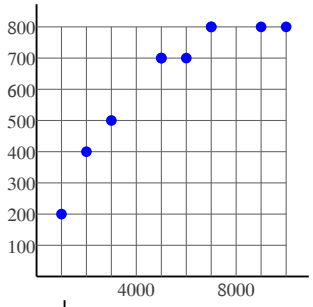
This can be modeled by the equation $y = 407x - 4920$ where x is the corruption score and y is GDP per capita in dollars.



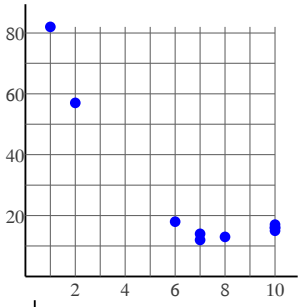
a) What does the y-intercept of this function represent?

b) According to the model, what would be the GDP per capita of a country with a corruption score of 38? Round your answer to the nearest dollar.

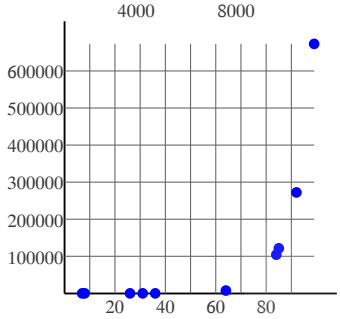
Answers to Assignment- Scatter plot

1) 

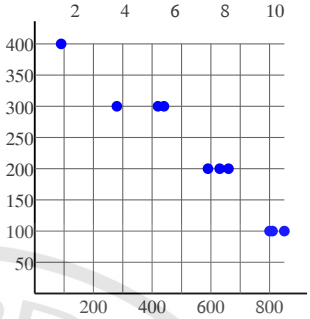
Positive correlation
Quadratic
$y = 0.064052x + 287.71$
$r^2 = 0.817$

2) 

Negative correlation
Quadratic
$y = -6.2285x + 70.222$
$r^2 = 0.756$

3) 

Positive correlation
Exponential
$y = 4263.6x - 108890$
$r^2 = 0.5$

4) 

Negative correlation
Linear
$y = -0.40744x + 446.94$
$r^2 = 0.957$

5) Y-intercept: The GDP per capita of a country with a corruption score of zero
$12,565

6) Y-intercept: The population of the city when it was founded
681,300

7) Y-intercept: The original amount invested
$5,937

8) Y-intercept: The population of the city when it was founded
43,000

9) 8 championships, 34 appearances

10) $32,819, 42

11) Y-intercept: The running pace of a newborn baby
8.39 minutes/mile

12) Y-intercept: The GDP per capita of a country with a corruption score of zero
$10,546